STATION CIRCULAR 101 JANUARY 1931

Winter Rations for the Farm Flock in Eastern Oregon

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SUMMARY

Alfalfa hay without other feeds proved entirely satisfactory for wintering breeding ewes.

One pound of silage and likewise one pound of grain fed in addition to alfalfa hay to ewes after lambing produced a slight but similar increase in the gains made by the lambs.

One pound of silage added to the hay ration throughout the winter added to the expense but did not improve the ration. The lambs were slightly larger at birth but seemingly not as strong as those from ewes fed alfalfa alone.

Two or three pounds of silage fed throughout the winter in addition to alfalfa produced no better results than one pound of silage.

Pea and bald-barley silage, corn silage, and sunflower silage are apparently of equal value when fed with alfalfa hay for wintering breeding ewes.

A 100-percent lamb crop at marketing time has under these conditions paid the market price for feed, paid for all labor, taken care of the death loss and replacement, and paid interest on the livestock investment. Lambing percentages above 100 percent would of course give greater returns. A good farm flock in Eastern Oregon can be made to produce an average lamb crop of 137 percent, counted at marketing time.

Winter Rations for the Farm Flock in Eastern Oregon

By

ROBERT WITHYCOMBE, F. M. EDWARDS, and E. L. POTTER

The five objects of these tests were: (1) to determine a satisfactory winter ration for breeding ewes; (2) to compare the results obtained from feeding alfalfa hay and silage both before and after lambing with those obtained from feeding alfalfa hay alone; (3) to determine the value of the addition of silage and of grain after lambing to a ration of alfalfa hay; (4) to compare different kinds of silage and different amounts of silage when fed with alfalfa hay; (5) to obtain a detailed record for a farm flock of grade ewes.

Plan of the experiments. The Station flock was divided for experimental winter feeding into lots containing ewes of as near the same age, quality, condition, and weight as possible. Complete records were kept for each of the tests. The ewes were all run as one flock during the pasture season and separated into their respective lots during the winter feeding period. They were branded and tattooed for identification.

Feeds. The feeds used in these tests were produced on the Station farm and were generally of good quality. The alfalfa hay was fed as it came from the stack, except when the top or bottom of the stack was moldy or damaged. Similar cuttings of alfalfa hay were fed to all lots on test at the same time during any one particular period of the test. The hay was fed twice daily. The crops used for silage were corn, field peas and bald barley, and sunflowers. Silage was hauled fresh from the silo and fed once a day except when more than one pound per day was fed, in which case two equal feeds were given. Grain was fed whole and in two feeds per day.

The pasture consisted of native meadow, blue-grass, sweet clover, and grain stubble on irrigated and subirrigated lands.

Stock used. The ewes used for the first test were range ewes of unknown breeding, purchased in October, 1917. Their appearance indicated considerable proportion of fine-wool blood, together with a little black-face breeding. The rams used in all cases were good pure-bred Hampshires. The better ewe lambs each year were kept for replacement purposes. The original ewes were used for only two years. In subsequent years the ewes used were all descendants of the original stock. By 1930 most of the ewes in the flock had three to five top crosses of Hampshire breeding. The ewes were generally in a good, thrifty condition at the beginning of each test and all had sound mouths.

Shelter and equipment. The ewes were fed in open lots, which were fairly well protected for feeding and lambing. In feeding hay, panels were

used, and the grain and silage were fed in troughs. The ewes had free access to running water and rock salt (½ ground) at all times.

Feed lots were kept well bedded with straw, especially during lambing. After lambing the ewes and lambs were moved into a shed and kept in small pens for a few days, after which they were placed in outside lots.

RATIONS BEFORE AND AFTER LAMBING

Four years' work on rations for ewes before and after lambing has been completed. The rations fed to the different lots were as follows:

Before lambing	*After lambing*
Lot 1....Alfalfa hay	Alfalfa hay
Lot 2....Alfalfa hay	Alfalfa hay and 1 pound grain
Lot 3....Alfalfa hay	Alfalfa hay and 1 pound silage
Lot 4....Alfalfa hay and 1 pound silage	Alfalfa hay and 1 pound silage

The grain fed was whole barley except one year, when whole oats was used. Pea-and-bald-barley silage was used during all four years.

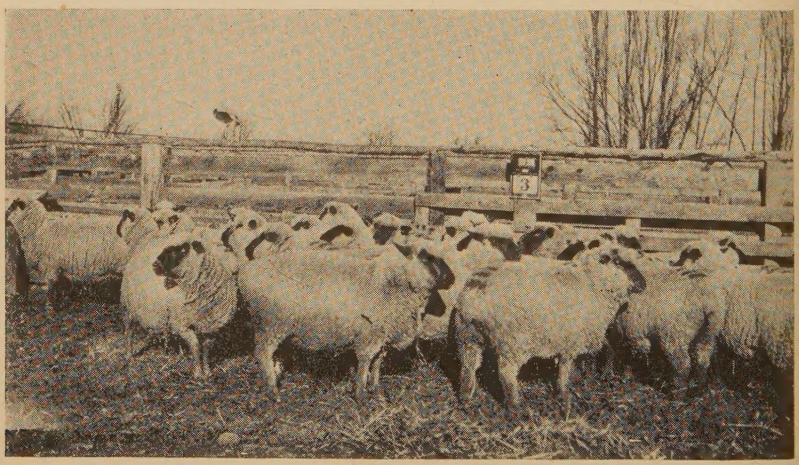

Figure 1. Typical lot at the beginning of the tests. All lots were as nearly alike as it was possible to get them.

Table I gives a summary of the records of weights, gains, and feed for the four years.

The average length of the feeding periods for the four years was 98 days and of this the ewes were on the "before lambing" ration for an average of 52.5 days and on the "after lambing" ration for 45.5 days. The ewes were in good, thrifty condition when the test began. They were given a full feed of alfalfa hay for the entire time, but the grain or silage was limited to one pound per head daily for the time fed.

TABLE I. RATIONS BEFORE AND AFTER LAMBING

Summary of four years' work with a total of 102 ewes per lot
Average length of test 98 days

All lots fed all the alfalfa hay they would eat throughout the test

	Lot 1, per head	Lot 2, per head	Lot 3, per head	Lot 4, per head
Feed in addition to alfalfa	.....	Grain after lambing	Silage after lambing	Silage throughout the winter
	Lb.	*Lb.*	*Lb.*	*Lb.*
Initial weight	177.0	176.0	176.6	177.1
Final weight	167.1	167.0	168.3	168.4
Gain before lambing, 52.5 days	10.2	10.1	9.5	9.8
Loss during and after lambing—45.5 days	20.1	19.2	17.8	18.5
Net loss for 98 days	9.9	9.1	8.3	8.7
Feed per day—				
Alfalfa hay—				
Offered	5.51	5.28	5.29	4.95
Refused	.47	.49	.46	.55
Consumed	5.04	4.79	4.83	4.40
Grain	.....	.65	.....	.....
Silage	.....	.....	.66	.98

The ewes gained an average of 10 pounds per head before lambing and lost from 18 to 20 pounds during lambing, making a net loss ranging from eight to ten pounds. The ewes were in good condition in all cases, as is indicated by their weights. The difference in gains and losses between the lots was so small as to be within the limit of experimental error.

The amount of alfalfa hay fed to the first three lots before lambing was nearly the same. The ewes in these three lots were fed an average of 4.4 pounds of hay a day. Of this amount 0.32 pound was refused. Lot 4, which had one pound of silage a day throughout the winter, ate 0.3 pound less hay than the lots without silage.

TABLE II. HAY CONSUMED DAILY PER EWE BEFORE AND AFTER LAMBING

Summary of four years' work with a total of 102 ewes per lot
Average length of test 98 days

All lots fed all the alfalfa hay they would eat throughout the test

	Lot 1	Lot 2	Lot 3	Lot 4
Feed in addition to alfalfa	.....	Grain after lambing	Silage after lambing	Silage throughout the winter
	Lb.	*Lb.*	*Lb.*	*Lb.*
Before lambing	4.25	4.03	4.09	3.82
After and during lambing	5.95	5.67	5.69	5.06
Increase	1.70	1.64	1.60	1.24

The lambs ate some hay and doubtless some of this increase in consumption is due to that.

Table III gives the lambing record of the various lots, figured on the basis of the ewes that actually lambed.

TABLE III. LAMBING RECORD

Average of four years' work with a total of 102 ewes per lot

	Lot 1	Lot 2	Lot 3	Lot 4
Feed in addition to alfalfa	------	Grain after lambing	Silage after lambing	Silage throughout the winter
	%	%	%	%
Lambs born	183.2	178.1	173.4	175.8
Lambs lost during and before end of lambing	9.9	14.6	11.7	20.0
Lambs marked	173.3	163.5	161.7	155.8
Lambs lost on pasture	6.9	------	10.6	6.3
Lambs matured	166.4	163.5	151.1	149.5

The percentage of lambs born was high in all lots. The difference in the number of lambs born in Lots 1, 2, and 3 was apparently due to causes other than feed as these three lots were handled and fed as nearly alike as possible until the lambs were born. Lot 4 had silage before lambing, but since the silage was fed for only 52.5 days before lambing and since the "number of lambs born" includes the dead lambs, it would seem that the silage fed for this short period had no effect on the number of lambs born. There was a marked difference, however, in the number of lambs lost during the lambing season between Lot 1 on straight alfalfa and Lot 4 which had silage through the winter. There was also a difference in the birth weights. The lambs from Lot 4 averaged at birth 9.56 pounds while the lambs from the other three lots averaged 9.33 pounds, or .23 pound less. The lambs from the ewes that had silage through the winter were therefore larger at birth but somewhat weaker.

During the summer the lots were all run together and were separated only when the lambs were weighed. The average loss of lambs during the summer was 6 percent. During the third year of this test dogs caused a heavy summer loss, especially in Lot 3. If the loss caused by dogs were deducted from the total loss for each lot, the number of lambs lost during the summer in Lots 1, 3, and 4 would be exactly the same. It was apparent that the difference in the summer losses for each of the different lots was not caused by the difference in winter feeds. The lambs seemed strong and healthy when they were turned on to spring pasture. The losses were due to bloat, dogs, and unknown causes.

Final weights were taken and the test for the year terminated at the time the wether lambs were marketed. The wether lambs were sold to local shippers with the exception of two years when they were shipped by the Station to the North Portland market. Some of the ewe lambs were kept to replace old ewes in the Station flock and the others were sold to local sheepmen for breeding stock. The first two years of the experiment all lambs in each lot were weighed together. During the last two years the single and twin lambs of each lot were weighed separately. The average weight of the lambs when the test was ended was 87 to 90 pounds at the Station, weighed off pasture and as soon as separated from the ewes, without shrink.

The difference in the average gains shown by the lambs of the various lots at marketing time is largely attributed to the rations fed to the ewes

TABLE IV. GAIN FOR LAMBS, BIRTH WEIGHT TO MARKETING WEIGHT

Average for four years—Per-head basis

	Lot 1	Lot 2	Lot 3	Lot 4
Feed fed ewes in addition to alfalfa hay	None	Grain after lambing	Silage after lambing	Silage throughout the winter
	Lb.	*Lb.*	*Lb.*	*Lb.*
Gain per lamb	78.40	80.87	80.83	81.35
Difference over Lot 1	.....	2.47	2.43	2.95

after lambing. The feed evidently influenced the quantity of milk produced by the ewe and this in turn accounts for the gains made by the lambs. The greater gains of the lambs in Lots 2, 3, and 4 would make possible the marketing of these lots approximately one week sooner than for Lot 1, and at the same weight.

The addition of 1 pound of grain to a full feed of alfalfa hay for 30 days after lambing replaced 0.43 pound hay per day and produced lambs that showed a total gain at marketing time of 2.47 pounds more than lambs from ewes fed only alfalfa. For each lamb matured 19 pounds of grain was fed.

The addition of 1 pound of silage to a full feed of alfalfa hay for 30 days after lambing replaced 0.39 pound of hay per day and produced a lamb that showed a total gain at marketing time of 2.43 pounds more than lambs from ewes fed only alfalfa. For each lamb matured 19 pounds of silage was fed.

In the daily ration of 1 pound of silage and a full feed of alfalfa hay before and after lambing, the 1 pound of silage replaced 0.56 pound of hay per day for the entire period and produced a lamb with 2.95 pounds more gain at marketing time than lambs from ewes fed only alfalfa. For each lamb matured 64 pounds of silage was fed.

Grain and silage fed after lambing show about equal results. Both apparently increased the amount of milk produced by the ewes. The lambs of the two lots made approximately the same gains.

Figuring the cost of the feed required to make the additional gain per lamb and crediting for the hay saved, with alfalfa hay at $10.00, silage $5.00, and grain at $30.00 per ton, each additional pound of gain made by feeding grain during and after lambing cost 10¢. Each pound of additional gain made by feeding silage during and after lambing cost 2.3¢, while the additional gain made by feeding silage throughout the winter cost 4.6¢ per pound of gain.

Considered from all angles these tests indicate the following: (1) Straight alfalfa hay throughout both winter and lambing season is very satisfactory but may be slightly improved by the use of 1 pound of silage after lambing. The erection of a silo for this one purpose, however, would hardly be practicable for less than 2,000 ewes, and that number would need only 30 tons. (2) The use of silage throughout the winter was expensive and any increase in size of lambs was offset by heavier loss of lambs during the lambing season. (3) Grain fed after lambing gave no better results than an equal weight of silage. (4) The exact amount of gain obtained from this supplemental feeding varied greatly in the different tests and in some cases the supplemental feeding produced no additional gain.

CORN, PEA-AND-BALD-BARLEY, AND SUNFLOWER SILAGE WITH ALFALFA HAY

One year's work on rations of alfalfa hay fed with different kinds of silage shows little difference in the comparative value of these silages. The pea-and-bald-barley and the corn silage seemed to be relished a little better by the ewes, but the gains made by the different lots were approximately the same.

DIFFERENT AMOUNTS OF PEA-AND-BALD-BARLEY SILAGE WITH ALFALFA HAY

In one year different amounts of pea-and-bald-barley silage (1, 2, and 3 pounds) were fed with alfalfa hay for a 60-day feeding period before lambing. In this one test the use of 1 pound of silage was the most satisfactory in replacing hay as it replaced nearly as much as 2 pounds and more than 3 pounds of silage. No detrimental effects were noticed during lambing from the use of more than 1 pound of silage. There was also no apparent difference in the condition of the ewes.

ALFALFA HAY VS. ALFALFA HAY AND SILAGE

Seven years' work with 14 lots, containing 359 ewes, on winter rations comparing alfalfa hay and alfalfa hay and silage, shows results similar to those shown by Lots 1 and 4 of the four-year experiment already quoted. The average for the seven years shows that 1 pound of pea-and-bald-barley silage fed with a ration of alfalfa hay saved 0.43 pound of hay per day for a 60-day period before lambing. The percentage of lambs dropped figured on the number of ewes that lambed was nearly the same—180.0 percent for the straight-alfalfa-hay lot and 180.1 percent for the alfalfa-hay-and-silage lot. The loss of lambs during the lambing period was 4.01 percent greater for the lots receiving silage and alfalfa hay as compared to the lots on alfalfa hay alone.

Figure 2. The experimental farm flock on pasture.

FARM FLOCK RECORD

In order to answer the many inquiries received as to just what a farm flock will do through a series of years, a complete record was kept of the performance of the Experiment Station flock. This record includes all of the ewes on the farm, regardless of how fed or handled. Since the cost of maintaining a flock is determined by the number of ewes bred, the figures are all given on that basis.

TABLE V. LAMBING RECORD—13 YEARS—1918 TO 1930 INCLUSIVE

Year	Ewes			Total lambs and losses per 100 ewes bred				
	Number bred	Dead before lambing	Dry	Lambs born	Lambs lost during lambing	Lambs marked	Lambs lost on pasture	Lambs matured
		%	%	%	%	%	%	%
1918	228	1.32	14.90	121	10.50	111	*	.....
1919	119	3.52	10.10	139	11.60	128	*	.....
1920	47	.....	.....	170	10.60	160	*	.....
1921	102	.....	5.88	166	13.70	152	*	.....
1922	108	.....	24.10	128	12.00	116	4.63	111
1923	100	3.00	.....	184	17.00	167	9.00	158
1924	99	.....	2.02	193	37.40	156	3.03	153
1925	111	.90	6.31	163	16.20	147	5.41	141
1926	99	.....	4.04	159	15.20	143	7.07	136
1927	100	.....	7.00	161	13.00	148	11.00	137
1928	102	1.96	4.90	152	9.80	142	1.96	140
1929	122	1.64	4.10	166	8.20	158	2.46	156
1930	194	.....	8.25	136	9.79	126	10.30	116
Total	1611	1.12	8.19	151.15	13.53	137.62	6.38	136.71

*No record.

The variations of the farm flock lamb record, including the high and low percentages, were as follows:

	Low %	*High* %
Ewes dead before lambing	.....	3.52
Ewes dry	.....	24.10
Lambs born	121.00	193.00
Lambs lost during lambing	8.20	37.40
Lambs marked	111.00	167.00
Lambs lost on pasture	1.96	11.00
Lambs matured	111.00	158.00

It will be noted that the lowest lambing percentage was the first year, when the experiment started with ewes of uncertain age and breeding. At the beginning of the second year nearly half of these older ewes were sold. The lamb crop the second year is therefore distinctly better. The third year all of the old ewes were sold and only their daughters remained in the flock. The effect of this culling is shown plainly in the lamb crop. In 1930, on account of a desire to increase the size of the flock, very little culling was done and the resulting lamb crop was below average. The large number of dry ewes and the comparatively smaller lamb crop of 1922 is attributed to a ram that proved to be a poor breeder.

The highest percentage of lambs was born in 1924. This year also shows the largest loss during lambing. There was an unusually large percentage of twins and triplets and the losses were largely from these.

The lowest loss of lambs was in 1929. The lambs in that year were unusually strong and vigorous but the cause of this extra strength and vigor is not known.

The summer loss of lambs was highest in 1927. Of the 11 lambs lost this year 7 were killed by dogs. The following year, 1928, the loss was the lowest, with only two lambs lost on pasture—one from bloat and one from cause unknown.

TABLE VI. EWE LOSSES PER 100 EWES BRED—EIGHT YEARS

Year	Number of ewes	Feed lot	Pasture
		%	%
1923	100	3.00	6.00
1924	99	------	9.09
1925	111	.90	14.41
1926	99	------	5.05
1927	100	3.00	3.00
1928	102	1.96	3.92
1929	122	3.28	4.92
1930	194	------	6.70*
Total	927	1.40	6.69

*To September 1, 1930.

Table VI shows that the total yearly loss of ewes (feed lot and pasture) for the eight years was 8.09 percent. The high summer loss of 14.41 percent for the year 1925 was due to bloat on alfalfa. Of the 17 ewes lost that year 9 were lost from bloat. For the entire period 20 percent of the total loss of ewes was caused by bloat, 3 percent by dogs, 5 percent by lambing and udder trouble, and the remainder by other causes.

MAINTAINING THE FLOCK

Ewe lambs kept for the flock were selected from the year's lamb crop at marketing time. Care was taken to select only hardy lambs of good mutton conformation and Hampshire type. These lambs were fed alfalfa hay and usually some grain or grain screenings during the winter, with the idea of keeping them growing in a good thrifty condition and making some gain. The following spring, when the ewe lambs were approximately one year old, they were turned in with the flock. These yearlings were bred to drop their first lambs in the spring that they were two years old. For a farm flock of approximately 100 ewes it was found necessary to keep 20 to 25 ewe lambs each year for the replacement of ewes lost and old ewes sold.

The average yearly loss of breeding ewes was 8 percent. By carefully selecting ewe lambs and culling the breeding flock closely, it was possible to keep a flock of good ewes with sound mouths.

FLEECE WEIGHTS

A complete record of the wool produced by the farm flock has been kept since 1922. The sheep were sheared in May or June of each year. The average is as follows:

Ewes more than one year old	7.45 pounds
Ewes one year old	8.68 pounds
Rams	9.32 pounds
Flock average	7.71 pounds

MONTHLY GAINS OF LAMBS

For two years the lambs were all weighed once a month. The average birth weight of these lambs was 9.42 pounds. Their average weight when turned on to pasture was 18.4 pounds. After the ewes and lambs were turned on to pasture the average daily gain of the lambs by months was as follows:

1st month	0.54 pound
2d month	.53 pound
3d month	.47 pound
4th month	.41 pound
5th month	.25 pound

The actual inventory, death loss, and sales for a farm flock of 100 breeding ewes were found to be as follows:

Inventory	
Breeding ewes	100
Rams	2
Ewe lambs for replacement	23
Total	125
Death loss (at 8 percent)	10
Sales	
Lambs (matured 137 but kept 23 for replacement)	114 head
Old ewes	13 head
Wool	963 pounds

Table VII shows the yearly average of all the feeds fed to the farm flock for the six-year period.

TABLE VII. WINTER FEED PER HEAD, AVERAGE 1924-1929 INCLUSIVE

Average length of winter feeding 132 days

	Ewes	Ewe lambs	Rams
	Lb.	*Lb.*	*Lb.*
Alfalfa hay—			
Offered	564	274	356
Refused	49	17	14
Consumed	515	257	342
Silage	42	none	3
Grain	17	34	27
Grain screenings	51	110	70
Molasses	none	2.4	none

The ewes, and in some years the ewe lambs, were separated into different lots for experimental winter feeding work. This partly accounts for the number of different feeds used. The experiments with alfalfa hay alone have shown that the feeds other than alfalfa, while helpful, were not necessities.

The flock was run on the farm pastures for the portion of the year when not in the feed lot. There was also a little overlapping of hay and pasture.

FINANCIAL CONSIDERATIONS

All the facts necessary in order to determine the cost of production and the income have already been given, except the prices of the feed and pasture and the market price of the product. These items, however, will vary from year to year and from farm to farm. It may be said briefly that for the period of these tests, 1918-1929, the wool and a lamb crop of 100 percent counted at maturity would have paid a fair market price for feed, labor, interest, and all other items of cost, including the purchase of rams and the maintenance of the ewe lambs kept for replacement purposes.

With good care and management it is possible to obtain lambing percentages in excess of 100 percent. Lambs in excess of 100 percent greatly increase the flock returns without materially increasing the costs, and therefore greatly increase the net profit.